

A Descriptive Study of the Prevalence of Dorsal Spine Fracture in Shah Amanullah Ghazi Hospital in 2020

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Abstract:

The issue of dorsal spine fractures and their complications is one of the most serious events that any neurosurgeon encounters during his/her professional career. The dorsal spine is the most important part of the spine, and injuries to it can cause irreparable problems for the injured person. Dorsal spine fracture is a very serious, disabling and life-threatening condition that must be addressed and treated promptly.

The aim of our study was to determine the incidence of dorsal spine fractures in Shah Amanullah ghazi Hospital in terms of age, gender, causes, predisposing factors, type of fracture, complications, and type of treatment. Overall, the goal is to accurately determine the incidence of dorsal spine fractures, establish the correct treatment method, and minimize its complications.

The rationale for researching the incidence of dorsal spine fractures can be helpful in taking appropriate and timely measures to better treat and reduce the impact of the problem, as well as to better prevent its occurrence by the relevant authorities.

Keywords — Dorsal spine fracture, thoracic spine injury, prevalence, compression fracture, spinal cord injury, neurological deficit, traffic accidents, Afghanistan.

I. INTRODUCTION

Dorsal spine fractures following spinal trauma are a major disabling and fatal complication, often resulting from traumatic motor vehicle accidents and poly traumas resulting from this major complication. In situations where timely diagnosis and assistance are required, rapid action is essential to facilitate breathing, prevent obstruction, and maintain and protect the airway in these injured and traumatized patients. Furthermore, timely transfer to a specialized center is of particular importance and the passage of time in these patients must be considered. Because the first 6 hours are a golden, opportunity for dorsal spinal cord injury patients and play a major role in the patient's survival. Due to improper transfer and immobility of the patient, spinal cord injury goes hand in hand with spinal shock, edema, compression, and spinal cord compression, and sometimes leads to death.

II. METHODOLOGY

Our study is descriptive and was conducted in the form of a case series on 72 patients with dorsal spine fractures who visited Shah Amanullah ghazi Hospital during 2020. Medical results and research, such as the research conducted between 1992 and 2004 by Megeral and colleagues in Germany, showed that in 22-51% of cases, fractures were accompanied by neurological deficits, which was also proven in our research work, as in 55.4% of cases, neurological deficits were present simultaneously with fractures, while in 44.4% of cases, the deficit was not present in the patients.

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III. RESULT / DETECTION:

From a study conducted in 2020 at Shah Amanullah ghazi hospital on dorsal spine fracture after spinal complications, the percentage of fractures in men was 88.9% and in women was 11.1%. According to this study, the typical age of fracture was 20 to 30 years, of which 36.1% were due to accidents. In terms of causes, the most common causes were traffic accidents with 33%, followed by war incidents, landmine explosions, and suicide bombings with 30.5% of the incidents in this study. In addition, the most common vertebra injured was the dorsal spine, which accounted for 58.3%. In terms of fracture type, the most common type of fracture occurred was the compression type, which accounted for 57%. In terms of spinal cord injury, the majority of cases, at 36.1% of all cases, were due to spinal cord injury. By analyzing and evaluating the data, we found that the Flexion/Compression mechanism is involved in most cases of this disease, accounting for 57.2% of all cases. According to this study, the most common neurological deficit in affected patients, which accounted for 22.2%, was paraplegia with urinary incontinence, and in most cases, 44.4% of patients, there was no neurological deficit. By evaluating the figures of this study, it is clear that a high percentage of cases were treated conservatively, accounting for 65.27%.

A. Percentage of dorsal spine fracture by gender:

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Among the 72 individuals with dorsal spine fracture who referred to Shah Amanullah ghazi hospital, 64 (88.9%) were male and 8 (11.1%) were female. By analyzing and evaluating the above figures, we find that a high percentage of dorsal spine fracture occurred in men, mainly due to the greater exposure of male soldiers to trauma, and because the number of female soldiers in the ranks of the National Security was small, they were less likely to engage in combat, sports, reconstruction, and other activities.

TABLE I
 PERCENTAGE OF DORSAL SPINE FRACTURE BY GENDER

Gender	Number of accidents	Percentage
Men	64	88.9
Women	8	11.1
Total	72	100%

B. Percentage of dorsal spine fracture cases by age:

Among 72 individuals with dorsal spine fractures, the highest incidence of the disease, which is 26 cases and 36.1% of all cases, occurred in the third decade of life, while the number of cases in the fourth decade was 22.2% and for the fifth decade was 16.06%. While the percentage obtained in the first decade and from the fifth decade onwards is 12.5%. The aforementioned figures indicate a high percentage of disease cases in the third decade of life. The reasons for the high incidence of disease in the third decade of life among military personnel include combat activities, sports, daily activities, and exposure to trauma.

TABLE II
 PERCENTAGE OF DORSAL SPINE FRACTURE CASES BY AGE TABLE

Age	Number of accidents	Percentage of current research
10 To 19	9	12.05%
20 To 29	26	36.01%
30 To 39	16	22.02%
40 To 49	12	16.05%
More than 50 years old	9	12.05%
Total	72	100%

C. Percentage of cases of dorsal spine fracture by cause

Among individuals with dorsal and thoracic spine fractures, 24 (33%) were traffic accidents, 18 (25%) were falls from heights, 22 (30.5%) were mine explosions, 5 (6.9%) were falls due to excessive weight, and 3 (4.1%) were criminal incidents. By analysing and evaluating the above figures, we find that a high percentage of dorsal spine fracture are caused by traffic accidents and mine explosions.

The main causes of illness caused by traffic accidents and mine explosions among national security personnel include speeding, reckless driving, failure to use safety equipment such as seat belts, and

involvement in combat activities and dealing with explosives.

TABLE III
PERCENTAGE OF CASES OF DORSAL SPINE FRACTURE BY CAUSE TABLE

Causes	Numbers	percentage of current research
Traffic accident	24	33%
Falling from a height	18	25%
Mine explosion	22	30.05%
A heavy object falling on a person	5	6.09%
Criminal	3	4.01%
Total	72	100%

D. Percentage of dorsal spine fracture based on mechanism of injury:

The most common mechanism leading to dorsal spine fracture was flexion/compression, which was involved in 34 cases (47.2%), the remaining 20 cases (27.7%) were due to axial compression mechanism, and 7 cases (9.7%) were due to Distraction mechanism. By analyzing and evaluating the above figures, we find that the flexion/compression mechanism is involved in most cases of this disease.

TABLE IV
PERCENTAGE OF DORSAL SPINE FRACTURE BASED ON MECHANISM OF INJURY

Percentage	Number of accidents	Mechanism
27.7%	20	Axial compression
47.2%	34	Flexion/compression
9.7%	7	Distraction
4.2%	3	Extension
7%	5	Rotation
4.2%	3	Shear
100%	72	Total

E. Percentage of dorsal spine fractures by fracture type:

Of the 72 people with dorsal spine fractures, 42 had compression fractures, 23 had burst fractures, 7 had dislocation fractures, and 2 had seat belt fractures. The percentages obtained after analyzing and separating the figures are 57%, 31.94%, 8.34%, and 22.77%, respectively. By observing the above figures, it can be seen that a high percentage of cases of the disease are compressive fractures.

TABLE V
PERCENTAGE OF DORSAL SPINE FRACTURES BY FRACTURE TYPE TABLE

Percentage	Number of accidents	Deduction type
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57%	42	Compressive
31.94%	23	Burst
8.34%	7	Fr/Dislocation
2.77%	2	Seat Belt Fr
100%	72	Total

F. Percentage of thoracolumbar spine fracture level:

Of the 72 patients with thoracolumbar fractures in 42 cases, (58.3%) had fractures in the thoracolumbar junction, in 9 cases (12.5%) had fractures in the thoracic level, in 16 cases (22.2%) had in Fractures in the lumbar vertebrae, and in 5 cases (7%) had fractures in the thoracolumbar level at the time of the accident. When evaluating the above figures, we find that the majority of vertebral fractures occurred in the thoracolumbar junction.

TABLE VI
PERCENTAGE OF THORACOLUMBAR SPINE FRACTURE LEVEL TABLE

Spine Level	Numbers	Percentage
Cervical vertebrae	0	0%
thoracolumbar junction	42	58.03%
thoracic	9	12.05%
lumbar vertebrae	16	22.02%
thoracolumbar at the time of the accident	5	7%
Total	72	100%

G. Percentage of dorsal spine fractures by spinal cord injury:

Among 72 people with thoracolumbar fractures, 17 (23.6%) had complete spinal cord injury, 26 (36.1%) had partial spinal cord injury, and 29 (40.1%) had high spinal cord pressure. By examining the above figures, we find that in a large number of cases, that is, in 36.1% of all cases, the patient had partial spinal cord injury.

TABLE VII
PERCENTAGE OF DORSAL SPINE FRACTURE BASED ON MECHANISM OF INJURY

Spinal cord injury	Numbers	Percentage of current research
Complete	17	23.06%
Partial	26	36.01%
Healthy with spinal cord compression	29	40.03%
Total	72	100%

H. Percentage of dorsal spine fractures based on neurological deficit:

Among 72 patients with thoracolumbar fractures, 16 had paraplegia and urinary incontinence, 7 had monoplegia, 6 had Para paresis and urinary incontinence, 32 had no neurological deficit, and 11 had Para paresis. By analyzing and evaluating the above figures, the percentages were 22.2%, 9.7%, 8.3%, 44.4%, and 15.2%, respectively. According to this study, the most common neurological deficit in patients was paraplegia with urinary incontinence, and in most cases, 44.4% of patients do not have any neurological deficit.

TABLE VIII
PERCENTAGE OF DORSAL SPINE FRACTURES BASED ON NEUROLOGICAL DEFICIT TABLE

Percentage of current research	Numbers	Neurological defect
22.2%	16	Paraplegia/urinary incontinence
9.7%	7	Monoplegia
8.3%	6	Para paresis Urinary incontinence
44.4%	32	without defects
15.2%	11	Para paresis
100%	72	Total

I. Percentage of dorsal spine fractures treated:

Of the 72 individuals with thoracolumbar fractures, 19 (26.38%) underwent posterior intervention surgery and 47 (65.27%) underwent conservative treatment, while the fate of 6 patients (8.3%) is unknown. By evaluating the above figures, it is clear that a high percentage of cases were treated conservatively.

TABLE IX
PERCENTAGE OF DORSAL SPINE FRACTURES TREATED TABLE

Treatment	Numbers	Percentage
Posterior intervention	19	26.38%
Conservatively	47	65.27%
Vague	6	8.03%
Total	72	100%

IV. DISCUSSION (COMPARING WITH STUDIES)

1. Medical research, such as a study conducted in 2011 at Ibn Sina Hospital in Kabul by Dr. Said Abdul Wahid, has shown that the incidence of this disease is higher in men, which has also been proven in our research. The disease affects 88.9 percent of men and only 11.1

percent of women. By analyzing and evaluating the above figures, we find that the disease mostly affects males.

- In medical studies, such as the 2008 study by Hu et al., the typical age of fracture onset was between 20 and 40 years, indicating that fractures occur most frequently in the third and fourth decades of life, which was also confirmed in our research. Since most police officers were in this age range and exposed to injuries from combat, sports, and other physical activities, the resulting percentage for both decades combined is 58.3 percent.
- In medical research, such as a study conducted between 1992 and 2004 by Megeral and colleagues in Germany, the most common cause of this disease was car accidents, as in 57 cases, fractures occurred as a result of car accidents. This has also been proven in our research, as a large number, i.e. 30%, of thoracolumbar fractures were caused by traffic accidents, while falls from a height account for 25%, falls weight on person 6.90%, and criminal incidents account for 4.10% of the remaining cases.
- In medical research, such as the study conducted in 2011 in Kabul at Ibn Sina Emergency Hospital by Dr. Said Abdul Wahid Sadat, the most common mechanism of injury among patients was Flexion/compression, which accounted for 56.42% of cases. This issue has also been proven in our research, as in 47.2% of cases, the most common mechanism was Flexion/compression.
- In medical research such as Textbook 2008 Spinal Disorder and research conducted by Dr. Said Abdul Wahid Sadat, the most common type of compressive fracture was stated as 58 percent of the cases of this type of fracture, which was also proven in our research as 57 percent of the cases were compressive fractures, while explosive fractures accounted for 31.94 percent of the cases, simultaneous dislocation fractures for 8.34 percent, and belt seat fractures for 2.77 percent of all cases of fractures.
- In medical studies, such as the study conducted between 1992 and 2004 by Megeral and

colleagues in Germany, the most common area of exposure in terms of the direction of the spine was the thoracolumbar, as 62% of the fracture cases occurred in this level. This has also been proven in our research work. As 58.3% of the fractures occurred in this area, which is consistent with international research. In 22.2% of the other cases, the fracture occurred in the lumbar level, and thoracic fractures were a rare occurrence.

7. In medical research, such as the study conducted between 1992 and 2004 by Megeral and colleagues in Germany, in 22-51% of cases, fractures were accompanied by neurological deficits, which was also proven in our research, as in 55.4% of cases, neurological deficits were present simultaneously with fractures, while in 44.4% of cases, the deficit was not present in patients.
8. In medical research, such as the research conducted in 2011 at Ibn Sina Hospital by Dr. Said Abdul Wahid Sadat, the most common cases of spinal cord injury without neurological deficit were reported to be 71 percent, which was proven in our research too that the most common spinal cord injury without neurological deficit was 36.1 percent.
9. In medical research, such as the research conducted in 2011 at Ibn Sina Hospital, the usual treatment was conservative treatment, which was also proven in our research, as it constituted 65.27% of cases of conservative treatment. In the research, the majority of cases were treated conservatively and, in our research, the most common surgical intervention method was posterior intervention, which represented 26.36 percent of the cases. This result was consistent with the research study of Ibn Sina Emergency Hospital. In our research, 8.3% of thoracolumbar fracture are fatal cases because these cases are discharged from the hospital without conservative and surgical treatment, and their treatment is incomplete or unknown.

V. CONCLUSION

By evaluating the results obtained from the above study, it is concluded that the disease affects males

more than females and its incidence is more common in the third and fourth decades of life. According to the findings of this research, the most common type of fracture was the compression type, and the main cause of thoracolumbar fracture was traffic accidents. In most cases, the fracture occurred in thoracolumbar junction, and in most cases, there was no neurological deficit, And the most common neurological deficit in patients was paraplegia with urinary incontinence. From a treatment perspective, most patients recovered with conservative treatment, and the surgical treatment performed in most patients was posterior with pedicle-sacral fixation.

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